What is claimed is:

1. An implantable medical device for delivering a therapy to a patient's body and/or monitoring a physiologic condition of a patient comprising:

a battery to provide battery energy; and

an operating system powered by the battery energy providing control and timing functions ~~embodied~~ in at least one integrated circuit further comprising:

a system clock powered by the battery energy providing clock signals;

clocked logic circuits formed on said integrated circuit and responsive to said system clock to perform defined circuit functions in timed synchrony with said system clock signals;

a clock tree formed on the integrated circuit that couples said clock signals from said system clock to the clocked logic circuits; and

at least one self-timed logic circuit formed on said integrated circuit to perform defined circuit functions independent of said system clock

whereby the clock tree is minimized and clock energy is conserved.

2. The implantable medical device of Claim 1, further comprising:

means for sensing a physiologic condition of the patient and providing a physiologic signal; and wherein:

said self-timed logic circuit further comprises a signal processor that processes the physiologic signal comprising a plurality of self-timed logic elements formed into a chain that receives the physiologic signal at an input thereof, processes the physiologic signal, and provides the processed physiologic signal at an output after a self-timed logic propagation delay.

3. The implantable medical device of Claim 2, wherein the signal processor comprises a digital signal processor that provides analog-to-digital conversion of the physiologic signal provided by said sensing means and signal processing of the digitized physiologic signal.

4. The implantable medical device of Claim 2, wherein the signal processor comprises a digital signal processor that provides analog-to-digital conversion of the physiologic signal provided by said sensing means and processes the digitized physiologic signal with reference to predetermined discrimination criteria, determines the presence or absence of a predefined characteristic of the physiologic signal, and provides a sense event signal upon determination of the pre-defined characteristic.

5. The implantable medical device of Claim 4, wherein:

said clocked logic circuits comprise at least one timer that times out time periods as multiples of the clock time period in response to a sense event signal; and further comprising:

means responsive to time-out of a time period by said timer for performing a first device operation; and

means responsive to a sense event signal provided during time-out of a time period for performing a second device operation.

6. The implantable medical device of Claim 1, wherein said self-timed logic further comprises:

a microcomputer comprising a microprocessor, a timing and control bus, and RAM/ROM memory to store data and operating instruction sets of device operation algorithms that operates pursuant to the stored data and operating instruction sets to establish timed out time periods and perform therapy delivery and/or monitoring functions.

7. The implantable medical device of Claim 6, further comprising:

means for sensing a physiologic condition of the patient and providing a physiologic signal; and wherein:

said self-timed logic circuit further comprises a signal processor that processes the physiologic signal comprising a plurality of self-timed logic elements formed into a chain that receives the physiologic signal at an input thereof, processes the physiologic signal, and provides the processed physiologic signal at an output to said data and control bus after a self-timed logic propagation delay.

8. The implantable medical device of Claim 1, wherein said self-timed logic further comprises a plurality of self-timed logic elements formed into a chain that receives an input signal at an input thereof, processes the input signal and provides a processed output signal at an output thereof after a self-timed logic propagation delay.

9. An implantable cardiac pacing system for sensing cardiac signals and delivering pacing pulses through pace/sense electrodes situated in one or more heart chamber comprising:

a battery to provide battery energy; and

an operating system powered by battery energy providing control and pacing timing functions embodied in at least one integrated circuit further comprising:

a system clock powered by the battery energy providing clock signals;

a clocked logic circuit formed on said integrated circuit and responsive to said system clock to time-out a pacing escape interval;

means responsive to time-out of the pacing escape interval for generating and delivering a pacing pulse to the pace/sense electrodes;

clock to the clocked logic circuit;

at least one self-timed logic circuit formed on said integrated circuit to perform defined circuit functions independent of said system clock

whereby the clock tree is minimized and clock energy is conserved.

10. The implantable pacing system of Claim 9, wherein:

said self-timed logic circuit further comprises a signal processor coupled with said pace/sense electrodes that processes the cardiac signal comprising a plurality of self-timed logic elements formed into a chain that receives the cardiac signal at an input thereof, processes the cardiac signal, and provides the processed cardiac signal at an output after a self-timed logic propagation delay.

11. The implantable pacing system of Claim 10, wherein the signal processor comprises a digital signal processor that provides analog-to-digital conversion of the cardiac signal and processes the digitized physiologic signal.

12. The implantable pacing system of Claim 10, wherein the signal processor comprises a digital signal processor that provides analog-to-digital conversion of the cardiac signal, processes the digitized cardiac signal with reference to predetermined discrimination criteria, determines the presence or absence of a predefined characteristic of the cardiac signal, and provides a sense event signal upon determination of the pre-defined characteristic.

13. The implantable pacing system of Claim 12, further comprising:

means for restarting the time-out of the pacing escape interval in response to a sense event signal;

14. The implantable pacing system of Claim 10, wherein said self-timed logic further comprises:

a memory having a plurality of memory locations; and

means for triggering storage of said processed cardiac signal in the plurality of memory locations.

15. The implantable pacing system of Claim 9, wherein said self-timed logic further comprises a microcomputer comprising a microprocessor, a timing and control bus, and RAM/ROM memory that stores data and operating instruction sets of device operation algorithms, the microcomputer operating pursuant to the stored data and operating instruction sets to establish timed out time periods and perform pacing pulse delivery and to adjust sensing criteria for sensing cardiac events.

16. The implantable pacing system of Claim 15, further comprising:

means for sensing a physiologic condition of the patient and providing a physiologic signal; and wherein:

said self-timed logic circuit further comprises a signal processor that processes the physiologic signal comprising a plurality of self-timed logic elements formed into a chain that receives the physiologic signal at an input thereof, processes the physiologic signal, and provides the processed physiologic signal at an output to said data and control bus after a self-timed logic propagation delay.

17. An implantable medical monitor for monitoring a physiologic condition of a patient comprising:

physiologic sensor means for developing a physiologic sense signal;

an operating system to provide control and timing functions embodied in at least one integrated circuit formed of self-timed logic circuits and further comprising:

a signal processor that processes the physiologic sense signal comprising a plurality of self-timed logic elements formed into a chain that receives the physiologic signal at an input thereof, processes the physiologic signal, and provides the processed physiologic signal at an output after a self-timed logic propagation delay;

a memory having memory locations to store the processed physiologic sense signal data; and

means for triggering storage of the processed physiologic sense signal data in said memory locations.

18. The implantable monitor of Claim 17, wherein the physiologic sensor means comprises sense electrodes to sense an electrical signal of a body organ or muscle.

19. The implantable monitor of Claim 17, wherein the physiologic sensor means comprises sense electrodes to sense a cardiac signal.

20. The implantable monitor of Claim 17, wherein the physiologic sensor means comprises a physiologic sensor that senses a condition or state of the body from among the group comprising physical activity of the body, blood pressure, blood temperature, blood gas concentration, and blood pH.

21. An implantable medical device powered by a battery for delivering a therapy to a patient dependent upon a physiologic condition of a patient comprising:

physiologic sensor means for developing a physiologic sense signal;

a signal processor that processes the physiologic sense signal comprising a plurality of self-timed logic elements formed into a chain that receives the physiologic signal at an input thereof, processes the physiologic signal, and provides the processed physiologic signal at an output after a self-timed logic propagation delay;

an operating system embodied in at least one integrated circuit formed of self-timed logic circuits that receives the processed physiologic signal and generates a therapy trigger signal; and

therapy delivery means for delivering the therapy upon receipt of a therapy delivery trigger signal.

22. The implantable monitor of Claim 21, wherein the physiologic sensor means comprises sense electrodes to sense an electrical signal of a body organ or muscle.

23. The implantable monitor of Claim 21, wherein the physiologic sensor means comprises sense electrodes to sense a cardiac signal.

24. The implantable monitor of Claim 21, wherein the physiologic sensor means comprises a physiologic sensor that senses a condition or state of the body from among the group comprising physical activity of the body, blood pressure, blood temperature, blood gas concentration, and blood pH.